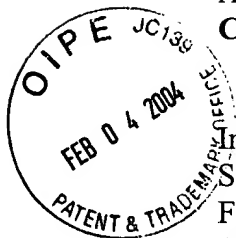


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Attorney's Docket No. 5000.89A  
Confirmation No. 5716

PATENT



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re: Hua-Shuang Kong et al.

Group Art Unit 1763

Serial No.: 09/715,576

Examiner Ram N. Kackar

Filed: November 17, 2000

For: SUSCEPTOR DESIGNS FOR SILICON  
CARBIDE THIN FILMS

February 3, 2004

MAIL STOP APPEAL BRIEF - PATENTS  
Commissioner for Patents  
Alexandria, VA 22313-1450

**TRANSMITTAL OF APPEAL BRIEF**  
**(PATENT APPLICATION – 37 C.F.R. § 1.192)**

1. Transmitted herewith, in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on December 5, 2003.
2. This application is filed on behalf of Cree, Inc., a large entity.
3. Pursuant to 37 C.F.R. § 1.17(c), the fee for filing the Appeal Brief is \$330.00. Any additional fee or refund may be charged to Deposit Account 50-0332.

Respectfully submitted,

Philip Summa  
Reg. No. 31,573

021176

SUMMA & ALLAN, P.A.

11610 North Community House Road

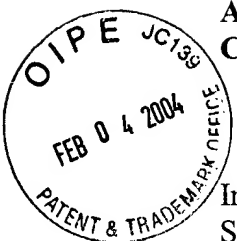
Suite 200, Ballantyne Corporate Park

Charlotte, North Carolina 28277-2162

Telephone: 704-945-6700

Facsimile: 704-945-6735

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APPEAL BRIEF

Sir:

In accordance with 37 C.F.R. § 1.192, Applicant's respectfully submit the following Appeal Brief.

(1) Real Party In Interest

The real party in interest is the Assignee, Cree, Inc. ("Cree"). Cree is a North Carolina corporation having its principal place of business at 4600 Silicon Drive, Durham, NC 27703.

(2) Related Appeals And Interferences

There are no related pending appeals or interferences. A parent and a sibling application have already issued as U. S. Patents Nos. 6,217,662 and 6,530,990 respectively.

(3) Status Of Claims

1-21. Cancelled

22. Pending and Appealed

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23. Cancelled

24. Pending and Appealed

25-48. Cancelled

49. Pending and Appealed

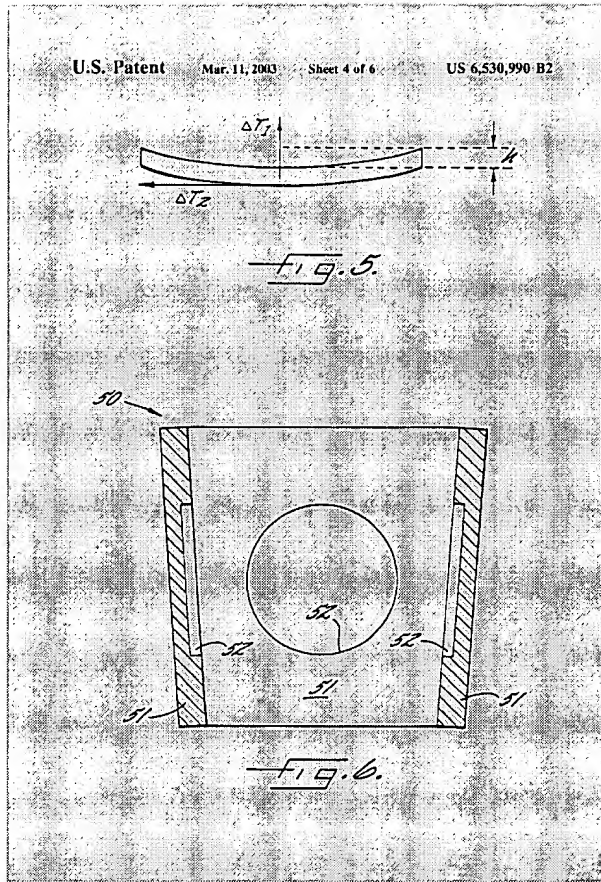
50. Pending

(4) Status Of Amendments

No amendments have been filed subsequent to final rejection.

(5) Summary of Invention

The invention is a chemical vapor deposition system for epitaxial growth of semiconductor materials on substrate wafers. The invention helps to minimize radial and axial temperature gradients across a substrate wafer by incorporating a susceptor that has the shape of an inverted truncated cone and that carries the wafers on its inwardly-facing portions. The spacing across the susceptor is small enough to keep the exposed faces of substrate wafers at substantially the same temperature as the unexposed faces that are in direct contact with the susceptor wall.



In the pending application, these features are expressed in Claim 49, illustrated in Figure 6, and described at page 9, line 14 through page 10, line 14. Identical Figure 6 of sibling Patent No. 6,530,990 is reproduced herein.

#### (6) Issues

The Examiner has applied a reference under § 102, but the pending claim does not read on the reference. Nevertheless, the Examiner maintains that the reference anticipates the claim because the claimed invention, "works and looks close to," the reference. Therefore, Applicants submit that the § 102 rejection must be withdrawn.

The Examiner has applied a combination of two references under § 103. Combining the references, however, requires that each forfeit its stated purpose. Therefore, Applicants submit that the § 103 rejection must be withdrawn.

#### (7) Grouping of Claims

Claim 49 is the only independent claim under appeal. Thus, all of the issues apply only to Claim 49 and no further grouping appears to be necessary.

(8) Argument

The Examiner has rejected Claim 49 under § 102 as anticipated by Ohmura and under § 103 as obvious in view of a combination of Ohmura and Von Der Ropp (Paper No. 16, Paragraphs 2 and 4, respectively).

The § 102 Rejection Under Ohmura No. 4,848,272

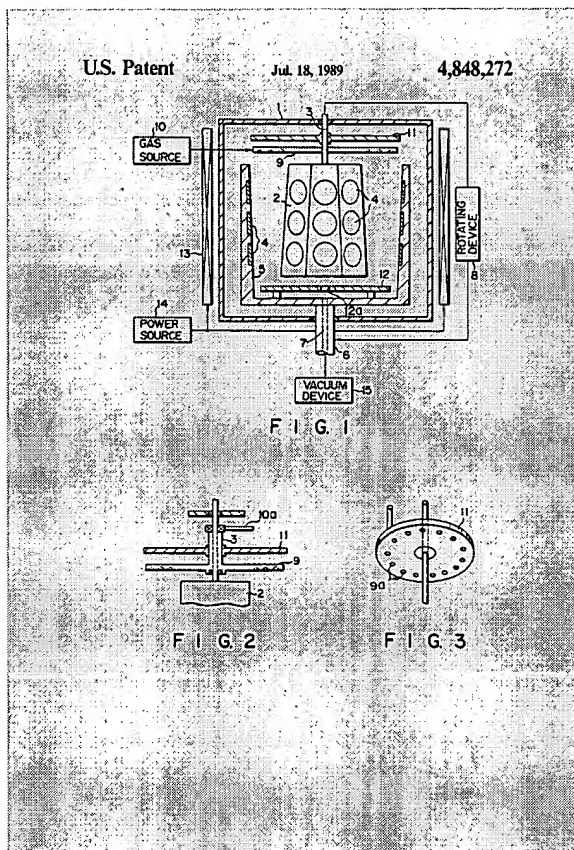
The Examiner has misapplied the standard of anticipation. Anticipation, like infringement, requires that each and every element in the claim appear in the anticipating reference.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 827 (1987), quoted in *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373 (Fed. Cir. 2003).

Claim 49 uses the transition phrase, "consisting essentially of" to define a single susceptor in which the interior facing walls are spaced closely enough for, "said facing walls to heat the exposed face of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer."

The transitional phrase, "consisting essentially of," is properly understood in the Office and under the case law to signal that the claimed invention, "necessarily includes the listed ingredients, and is open in a limited fashion to unlisted ingredients that do not materially affect the basic and novel properties of the invention," *PPG Industries v. Guardian Industries Corp.*, 156 F.3d 1351 (Fed Cir. 1998).

In contrast to Claim 49, Ohmura discloses a susceptor (2) within a susceptor (5) that precludes the walls of the inner facing susceptor from meeting the spacing recitations of Claim 49.



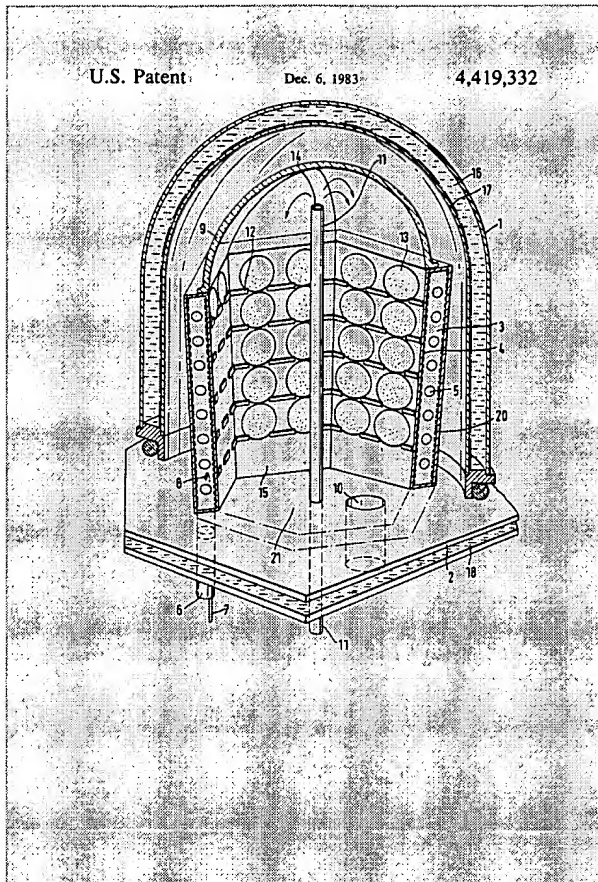
In attempting to use Ohmura as an anticipating reference, the Examiner concludes (without evident support) that Ohmura's inner susceptor does not have, "any material affect on the basic and novel properties of the invention" (page 4 of Paper No. 16) and thus attempts to dismiss Claim 49's transitional phrase. The Examiner then goes on to conclude that the claimed invention, "works and looks close to that of Ohmura."

The Office is well aware that, "working and looking close," is not the standard of anticipation and that the Examiner has failed to properly apply Ohmura under § 102 because Ohmura fails to meet the "all elements" rule when compared to Claim 49. Accordingly,

Applicants respectfully submit that the § 102 grounds of rejection must be removed as against claim 49 and its dependent claims.

#### The § 103 Rejection Under Ohmura in View of Von Der Ropp No. 4,419,332

The combination of Ohmura and Von Der Ropp is newly applied in the final rejection (Paper No. 16). Nothing other than the claims provides a motivation for the combination, however, and even if the combination is applied, it defeats the function of each respective reference.



omitted).

With respect to the function of each reference, Ohmura provides two concentric susceptors (2, 5) that rotate mutually opposite to one another to heat wafers as evenly as possible; e.g. Column 2, lines 8-27. According to Ohmura, the concurrent rotation of the susceptors agitates the reaction gases, thus increasing the uniformity of the temperature and gas flow.

Von Der Ropp functions to provide a “heat pipe” (20) in the reaction chamber to help keep the reaction temperatures as constant as possible (e.g. Column 2, lines 16-40). At least one of Van Der Ropp’s goals is to eliminate moving parts and thus more easily seal the reactor; Column 2, lines 54-56.

With respect to motivation, the applied references fail to provide any reason—other than a hindsight view of the claims—as to why they should be combined. Thus, the combination must fail on this basis. “Therefore, when determining the patentability of a claimed invention which combines two known elements, the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.” *In re Beattie*, 974 F.2d 1309, 1311-12 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GMBH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1462 (Fed. Cir. 1984)) (internal quotation marks

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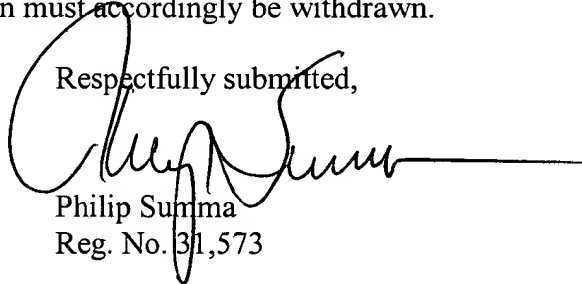
Therefore, “removing one (of Ohmura’s susceptors) for the sake of simplicity” (quoting the Examiner on page 3 of Paper No. 16) would defeat Ohmura’s function.

Viewed alternatively, adding a second, rotating susceptor to Von Der Ropp adds nothing to Von Der Ropp’s vapor pressure related temperature control system and would defeat Von Der Ropp’s improved seal based on eliminating moving parts.

As the Office is well aware, when a combination of references defeats the function of the individual references, the combination is considered illogical, because the person of ordinary skill in the art would not consider it obvious to vitiate the function of a patent’s disclosure. *In re Spinnoble*, 405 F.2d 578, 587 (CCPA, 1969) (“Thus, a combination of either Lockhart or Bujan with Jensen alone would produce a seemingly inoperative device.”). See also *Tec Air, Inc. v. Denso Mfg. Mich., Inc.*, 192 F.3d 1353, 1360 (Fed Cir. 1999), (“If when combined, the references ‘would produce a seemingly inoperative device,’ then they teach away from their combination. (finding no suggestion to modify a prior art device where the modification would render the device inoperable for its intended purpose)”) (internal citations omitted).

Therefore, because the combination of Ohmura and Van Der Ropp frustrates the purpose of each, Applicants submit that the combination offers no logic to the skilled person and that the § 103 rejection must accordingly be withdrawn.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Philip Summa", with a long horizontal line extending to the right.

Philip Summa  
Reg. No. 31,573

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Summa & Allan, P.A.  
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(9) Appendix: The Claims Involved In The Appeal

22. A chemical vapor deposition system according to Claim 49 wherein said reaction vessel is made of quartz.

24. A chemical vapor deposition system according to Claim 49 wherein said source of electromagnetic radiation comprises an induction coil surrounding said reaction vessel.

49. A chemical vapor deposition system consisting essentially of:  
a reactor vessel formed of a material substantially transparent to electromagnetic radiation;  
a gas supply system in fluid communication with said reactor vessel;  
a source of electromagnetic radiation external to said reaction vessel; and  
a susceptor within said reaction vessel, and formed of a material that is thermally responsive to electromagnetic radiation, said susceptor being an inverted truncated cone defined by a plurality of adjacent straight sidewall sections and a plurality of wafer pockets on the inner circumference of said truncated cone, with the spacing between facing walls being small enough for said facing walls to heat the exposed face of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer.



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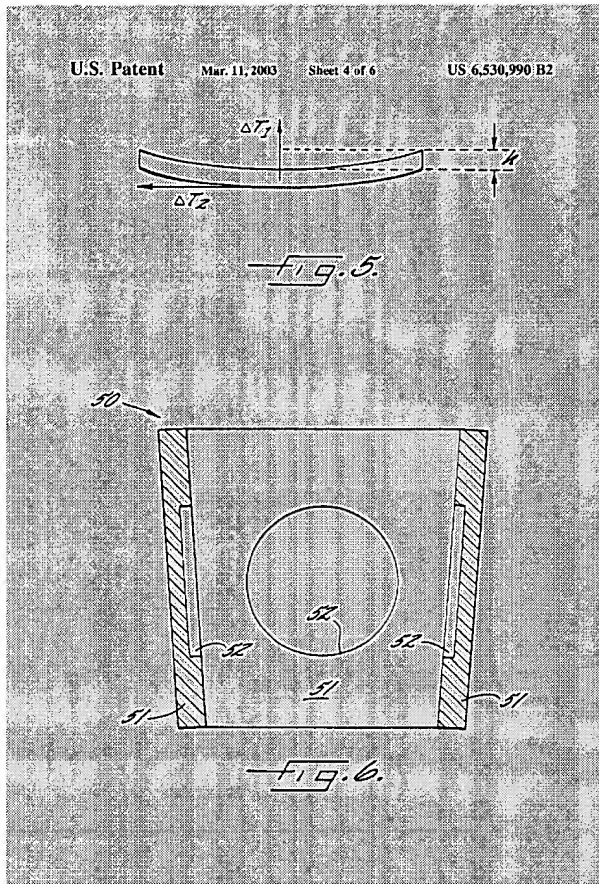
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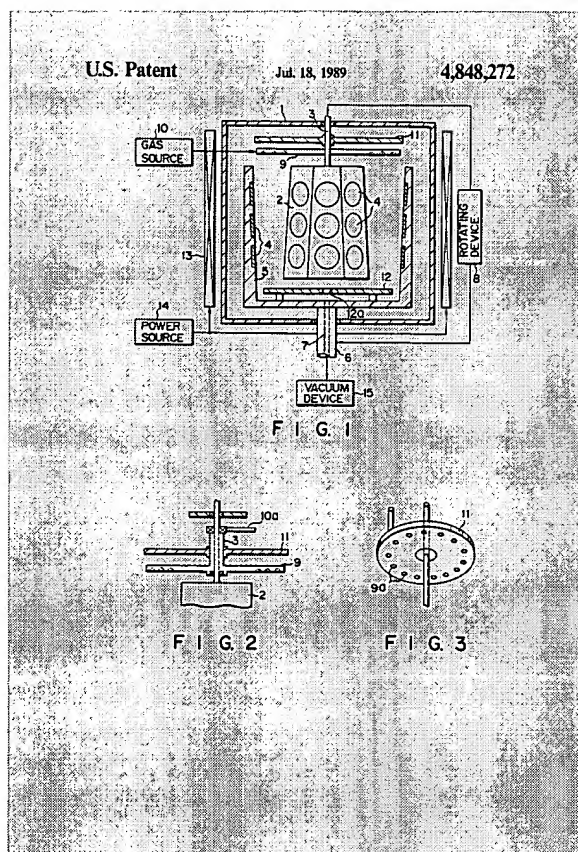
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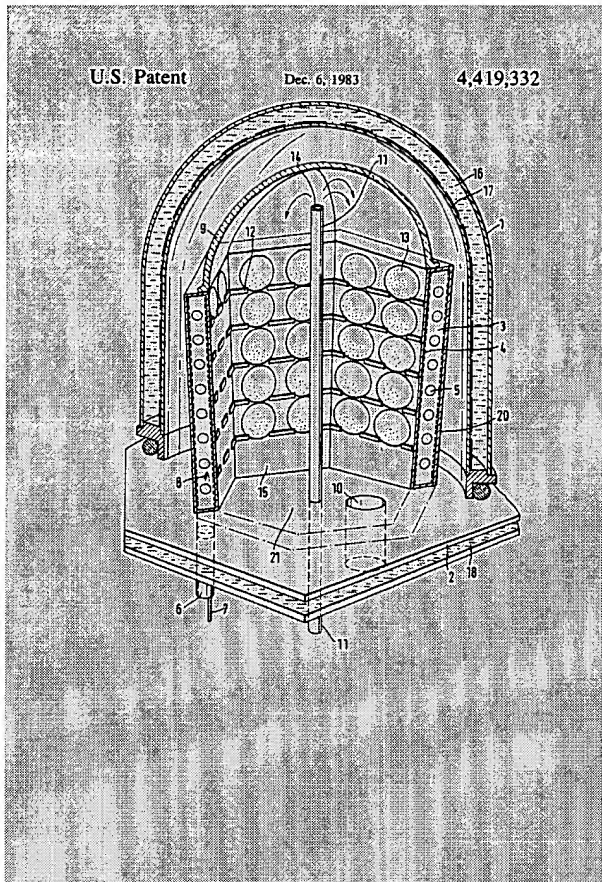
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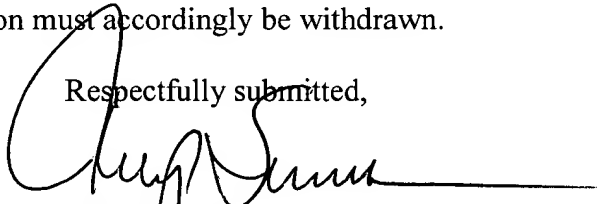
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